APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	Docket No: Q64387
Volkmar HEUER	
Appln. No.: 09/863,321	Group Art Unit: 2661
Confirmation No.: 1370	Examiner: Tri H. PHAN
Filed: May 24, 2001	

For: A METHOD OF TRANSMITTING SYNCHRONOUS TRANSPORT MODULES VIA A SYNCHRONOUS TRANSPORT NETWORK

APPEAL BRIEF UNDER 37 C.F.R. § 41.37

MAIL STOP APPEAL BRIEF - PATENTS
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In accordance with the provisions of 37 C.F.R. § 41.37, Appellant submits the following:

I. REAL PARTY IN INTEREST

The real party in interest is Alcatel Lucent, the assignee of this application.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

III. STATUS OF CLAIMS

Claims 1-10 are pending in the application.

Claims 1-3 are rejected under 35 USC 102(e) for anticipation by Wakim (USP 6,477,178).

Claims 5-8 are rejected under 35 USC 103(a) as unpatentable over Wakim.

Claims 9 and 10 are rejected under 35 USC 103(a) as unpatentable over Wakim in view of Martin (EP 0874488 A2).

IV. STATUS OF AMENDMENTS

No amendments were filed subsequent to the final Office action mailed December 22, 2005.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A description of the background Technology is necessary to properly understand the invention.

SDH (Synchronous Digital Hierarchy) and SONET (Synchronous Optical Network) are two different synchronous digital transport networks, in which useful information is carried in "containers." The containers contain an overhead section known as "path overhead" together with which they are referred to as virtual containers. The virtual containers (referred to as "multiplex units") are themselves multiplexed in a frame referred to as a synchronous transport module, with the virtual containers arbitrarily positioned in the payload section of the transport modules and addressed by a pointer in the overhead section of the transport modules.

Note that the overhead section of the transport module is different from the "path overhead" which is contained in each virtual container. The overhead section of the synchronous transport module contains a pointer to the largest multiplex unit contained in the payload section and also includes one section referred to as RSOH (regenerator section overhead) and one section referred to as MSOH (multiplex section overhead). These contain items of check- and control information which has conventionally been used when a SDH- or SONET-based sub-network interfaces with a transport network of a public operator. This typically involves terminating the overhead of each transport module from a subnetwork and generating new overhead for the transport network, and vice versa when transporting in an opposite direction. Having many different such interfaces with different subnetworks can lead to problems in

consistency as to how the check and control information is used/mapped. Thus, a stated goal of the present invention is to provide a multiplexer which allows frames (e.g., STM frames) with a payload section and an overhead section to be transmitted without having to access the overhead sections of the frames.

The invention can be understood with reference to Figs. 1 and 2. Fig. 1 illustrates two synchronous digital sub-networks SN1 and SN2 each carrying frame-structured synchronous multiplex signals; in this example they are synchronous transport modules of the STM-4 type. The method of the present invention is illustrated in Fig. 2 and described from the top of page 8 through the top of page 11 of the specification. Moving from right to left at the bottom of Fig. 2, virtual containers are combined into synchronous transport modules STM-N. Each transport module is a frame-structured synchronous multiplex signal with payload and overhead sections, and in the payload section carries multiplex units (virtual containers) which are multiplexed into the payload section in accordance with a multiplex hierarchy specified but the ITU-T.

At the interface between the VPN and WAN as shown in Fig. 2, new multiplex units are formed and multiple such multiplex units are concatenated to form virtual concatenations VC-4v. The examples illustrated in Fig. 2 are such that a virtual concatenation will include 2, 5 or 17 concatenated multiplex units. The concatenated multiplex units are then combined into an administrative unit group (AUG), and the AUG is then embedded in the payload section of a new transport module STM-N, which is then transmitted on the transport network WAN.

The end result is to have transport modules in the transport network WAN which have a payload section and an overhead section. The overhead section will be available exclusively for control and management functions of the public transport network. The payload section will carry a plurality of multiplex units, with the multiplex units being formed of a concatenation of newly-formed multiplex units, and the multiplex units carrying as payload the STM frames (e.g., the STM-4 transport modules from sub-network SN1) to be transmitted, including the overhead sections of those frames. Note again that that the overhead section of the frames is not "path overhead." Path overhead is what is included in each of the original virtual containers of the VPN, i.e., designated by the second box from the right in each of the two lowermost rows in Fig. 2. When these containers are multiplexed into a synchronous transport module, there is another overhead added to this module which is not path overhead but instead is management overhead and includes things such as the RSOH and MSOH discussed above. This overhead as conventionally been deconstructed and terminated at the interface between VPN and WAN when transmitting out onto the WAN. According to the invention, this STM overhead will instead be included as payload in newly-formed transport modules on the WAN.

Claim 1 recites:

> 1. A method of transmitting, via a synchronous digital transport network, a frame-structured synchronous multiplex signal, composed of frames having a payload section and an overhead section, wherein the payload section comprises multiplex units that are multiplexed according to a multiplex hierarchy, wherein the method comprises transmitting a frame of the frame-structured synchronous multiplex signal to be transmitted, including its unchanged overhead section, as payload in a concatenation of newly formed multiplex units.

Thus, in Fig. 2, the frame structured synchronous multiplex signal STM-N from the VPN, including its unchanged overhead section, ends up as payload in the new STM-N for the WAN, which is formed of a continuous concatenation of newly-formed multiplex units.

With regard to claim 9, the first frames are the STM-N signals on the left side of Fig. 2 in the VPN region, the newly-formed multiplex units are the signals 2xVC-4v, 5xVC-4v and 17xVC-4v in the WAN region of Fig. 2, and the second frames are the STM-N signals at the left side of Fig. 2 in the WAN region.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed on appeal are all those stated above, i.e.:

1. Whether claims 1-3 are anticipation by Wakim.
2. Whether claims 5-8 are unpatentable over Wakim.
3. Whether claims 9 and 10 are unpatentable over Wakim in view of Martin.

VII. ARGUMENT

1. Claims 1-3 Are Not Anticipated by Wakim.

The problem Wakim is concerned with is how to transmit multiplex units of the SONET type over an SDH network. As described at the bottom of column 3, a synchronous transport signal 22 received over the SDH network may be an STM-4 signal. As described at lines 8-12 of column 3, the SPE decoder 18 receives this STM-4 signal and terminates the transport overhead portion of the signal. The decoder extracts Synchronous Payload Envelopes (SPE's) from the modules. The SPE's are what is referred to in the present disclosure as virtual containers, each with a payload portion and a path overhead. The paragraph beginning at line 8 of column 4 makes this further clear. It is explicitly stated that the SPE decoder terminates the transport overhead of the STM frame. The SPE is described as a virtual container (VC-3). It is stated that the decoder ***may also*** terminate the synchronous path overhead of each SPE. So there is a clear distinction between the transport module overhead, which ***is*** terminated, and the SPE synchronous path overhead, which ***may be*** terminated.

There are multiple distinctions between the present invention and Wakim. The most notable, however, is that in the present invention the overhead section of the frame-structured synchronous multiplex signal is included, unchanged, as payload in a concatenation of newly formed multiplex units. In Wakim, the path overhead is not terminated. This is conventional. Path overhead is by definition transparent from end to end. But the transport overhead of the synchronous transport modules is indeed terminated.

In Wakim, a container with path overhead is mapped to a container with path overhead (see paragraph bridging columns 7-8 of Wakim). But these are containers which have been extracted from a transport module which has been deconstructed and whose transport overhead has been terminated. There is no suggestion of placing the complete transport module, including its overhead, into the payload section of a container in a newly-formed multiplex unit. In fact Wakim teaches directly away from this by extracting the containers (SPE's) from the transport module and terminating the transport module overhead.

The examiner has disagreed with this argument of distinction, but has simply pointed out that Wakim teaches transmission without terminating overhead. But the examiner is pointing only to statements in Wakim about not terminating the ***path*** overhead, which is the overhead container within each container (SPE). Wakim does not teach not terminating the transport overhead of the transport module, and in fact explicitly states to the contrary.

Claim 1 recites that a frame-structured synchronous multiplex signal is composed of frames having a payload section and an overhead section, wherein the payload section comprises multiplex units that are multiplexed according to a multiplex hierarchy, and wherein a frame of the frame-structured synchronous multiplex signal, including its unchanged overhead section, is transmitted as payload in a concatenation of newly formed multiplex units. To satisfy this, Wakim must have a plurality of multiplex units multiplexed into the payload section of a frame-structured synchronous multiplex signal, and that frame-structured multiplex signal must have an overhead section, and this overhead section (and not simply the overhead within each multiplex unit, which is buried within the payload section of the synchronous multiplex signal) must be

included as payload in a concatenation of newly-formed multiplex units. This is clearly not the case in Wakim.

The examiner has not identified anywhere in Wakim where the overhead of the synchronous transport module of Wakim is placed within the payload section of a concatenation of newly-formed multiplex units.

In the Advisory Action, the examiner refers to lines 30-42 of column 7 of Wakim. But this describes mapping a virtual container into a transport module. The virtual containers in Wakim (also referred to as SPE's) cannot be the "frame-structured synchronous multiplex signal" referred to at the beginning of claim 1, for two reasons. First, they do not have the structure of a frame, and the examiner has not pointed out where in Wakim they are described as having the structure of a frame. To the contrary, they are virtual containers. Second, and more importantly, the frame-structured synchronous multiplex signal in claim 1 is defined as having a payload section which contains multiplex units that are multiplexed according to a multiplex hierarchy. The individual containers of Wakim are themselves multiplex units, but they do not include payload sections with a plurality of multiplex units multiplexed according to a multiplex hierarchy. Even if they are concatenated containers, they do not contain a plurality of multiplex units multiplexed according to a multiplex hierarchy.

So while Wakim may teach preserving the path overhead within virtual containers, it does not teach preserving the frame overhead of a frame which contains as payload a plurality of multiplex units multiplexed according to a multiplex priority.

The examiner has pointed to lines 9-35 of column 8, but this at best describes mapping a virtual container (SPE) into a concatenated container. It does not describe loading a frame including frame overhead into a concatenated virtual container.

In the Advisory Action, the examiner has disagreed with appellant's argument that an SPE is not a frame-structured signal. The examiner refers to lines 46-47 of column 10, where Wakim mentions the "next frame" of an SPE. It is submitted that this isolated use of the term "frame" is in a different context than the term is used in the present application, but without having to address that issue, it must still be remembered that a frame-structured synchronous multiplex signal is defined in claim 1 as being composed of frames having a payload section and an overhead section, wherein the payload section comprises multiplex units that are multiplexed according to a multiplex hierarchy. The SPE's in Wakim do not have a payload section which contains multiplex units multiplexed according to a multiplex hierarchy, and therefore cannot constitute frame-structured synchronous multiplex signals as that term is explicitly defined in claim 1.[1]

Claims 2-3 are not anticipated for the same reasons as claim 1. In addition, claim 2 is more specific as to exactly how the concatenation is performed and how the overhead section of a frame is packed into the payload section of a new frame. This is simply not taught in Wakim.

[1] It is noted that the examiner has equated the SPE with the claimed synchronous transport module and has also equated the STM-4 module of Wakim with the claimed synchronous transport module. It cannot be both, and this is simply an illustration in the flaw in the examiner's attempted reading of the claim on Wakim.

2. Claims 5-8 are not Unpatentable over Wakim.

Initially, it is noted that Wakim is assigned to Alcatel USA Sourcing, LP, a wholly-owned subsidiary of Alcatel Lucent, the assignee of the present application. The subject matter of Wakim which would otherwise be prior art to the presently claimed invention and the presently claimed were commonly owned at the time the invention as made, and Wakim is not available as prior art under 102(e)/103(a). In any event, the present invention clearly is neither shown nor suggested in Wakim.

First, it is noted that Wakim fails to teach the inclusion of a complete transport module, including its transport module overhead, as payload in a concatenation of newly-formed multiplex units, for the reasons discussed above.

There is no suggestion in Wakim of encapsulating a perfectly suitable transport structure inside another transport structure using a concatenation of multiplex units. It would not have been obvious to encapsulate a frame that could be transported as such through the network in another frame. Moreover, the term concatenation is in synchronous networks such as SDH or SONET a well defined technical term that does not leave room for interpretation to a skilled reader. Wakim does not teach a concatenation of multiplex units at all.

Wakim teaches that the SPE is either mapped into a STS-N frame or is multiplexed via TUG-3 into VC-4 and then mapped into STM-N. Both options are already known. Wakim does

not teach or suggest packing a STS-N or an STM-N into an STM-N and Wakim does not teach or suggest packing frames into a concatenation of newly formed multiplex units (VC-4).

3. Claims 9 and 10 Not Unpatentable over Wakim in view of Martin.

As noted above, Wakim is not properly prior art vs. the present application in view of the common ownership of Wakim and the subject matter of the claimed invention.

Further, claim 9 distinguishes over Wakim for the same reasons as discussed above. Martin does not teach what is missing in Wakim as discussed above. Further, however, claim 9 is much more explicit as to the structure of the original signal and how it relates to the structure of the signal eventually sent, and it is simply not possible for the examiner, even with a strained reading of claim 9, to read this on what is taking place in Wakim or any obvious combination of Wakim and Martin.

In this rejection, the examiner relies on Martin as the primary reference to teach most of the multiplexer as claimed, but the comparison with Martin is flawed for many of the same reasons as discussed above. Most notably, the examiner refers to lines 44-54 of page 3 of Marin as teaching the concatenation of newly-formed multiplex units, but lines 44-54 of column 3 of Marin simply describe the structure of a SONET frame, but there is no mention whatsoever of concatenation of multiplex units.

Further, the examiner refers to lines 29-32 of page 10 of Martin as teaching the second frames in whose payload sections the concatenated newly-formed multiplex units are inserted. But there is no mention in this passage of concatenation.

Finally, the examiner relies on Wakim to teach the inclusion of the unchanged overhead section of a frame as payload in a concatenation of newly-formed multiplex units. This is incorrect for all of the reasons discussed above in the context of the rejection of claim 1.

Conclusion -

For all of the reasons discussed above, it is respectfully submitted that the examiner has not presented a prima facie case of either anticipation or obviousness of the claimed subject matter, and reversal of the rejections is respectfully requested.

Respectfully submitted,

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WASHINGTON OFFICE
23373
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Date: December 26, 2006

CLAIMS APPENDIX

CLAIMS 1-10 ON APPEAL:

1. A method of transmitting, via a synchronous digital transport network, a frame-structured synchronous multiplex signal, composed of frames having a payload section and an overhead section, wherein the payload section comprises multiplex units that are multiplexed according to a multiplex hierarchy, wherein the method comprises transmitting a frame of the frame-structured synchronous multiplex signal to be transmitted, including its unchanged overhead section, as payload in a concatenation of newly formed multiplex units.

2. The method according to claim 1, wherein the method further comprises:

creating a number of new multiplex units of the same size, and concatenating these new multiplex units to form a virtual concatenation,

packing the frame, including the overhead section thereof, in payload sections of the concatenated new multiplex units,

creating at least one new frame and embedding the concatenated new multiplex units in the payload section thereof, and

transmitting the at least one new frame via the synchronous transport network.

3. The method according to claim 1, wherein the synchronous transport network is a SDH network, wherein the frames are synchronous transport modules of the type STM-N where N=1, 4, 16 or 64, and wherein the multiplex units are virtual containers of the type VC-N where N=11, 12, 2, 3, or 4 or contiguously concatenated virtual containers of the type VC-4-Nc where N=4 or 16, and wherein the newly formed multiplex units are virtual containers of the type VC-N where N=3 or 4.

4. The method according to claim 1 wherein, in a first of the newly formed multiplex units, the overhead section of a frame to be transmitted and path overheads of the multiplex units contained in the payload section of this frame are combined, and wherein one of the multiplex units from the payload section of this transport frame without the path overhead thereof is inserted into each of the remaining newly formed multiplex units of the concatenation.

5. The method according to claim 1, wherein a frame of the type STM-1, OC-3 or OC-3-3c is transported via two virtually concatenated virtual containers of the type VC-4 or via four virtually concatenated virtual containers of the type VC-3.

6. The method according to claim 1, wherein a frame of the type STM-4, OC-12 or OC-3-12c is transported via five virtually concatenated virtual containers of the type VC-4 or thirteen virtually concatenated virtual containers of the type VC-3.

7. The method according to claim 1, wherein a frame of the type STM-16, OC-48 or OC-3-48c is transported via seventeen virtually concatenated virtual containers of the type VC-4 or via fifty-one virtually concatenated virtual containers of the type VC-3.

8. The method according to claim 1, wherein a frame of the type STM-64, OC-192 or OC-3-192c is transported via sixty-eight virtually concatenated virtual containers of the type VC-4.

9. A multiplexer for a synchronous digital transport network comprising:

at least one tributary input for receiving a first frame-structured synchronous multiplex signal comprising first frames each having a payload section and an overhead section, wherein the payload section comprises multiplex units that are multiplexed according to a multiplex hierarchy,

a multiplex device, connected to the tributary input, for creating new multiplex units for concatenating the newly formed multiplex units to form a concatenation, and for packing a received frame, including the unchanged overhead sections thereof, as payload in the concatenation of the newly formed multiplex units, and

at least one output for creating and transmitting a second, frame-structured synchronous multiplex signal comprising second frames in whose payload sections the concatenated, newly formed multiplex units are inserted.

10. The multiplexer according to claim 9, further comprising a switching matrix for selectively switching of multiplex units, wherein the multiplex device is connected to a matrix input and the output is connected to a matrix output.

EVIDENCE APPENDIX:

There is no evidence submitted pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 or any other evidence entered by the Examiner and relied upon by Appellant in the appeal.

RELATED PROCEEDINGS APPENDIX

There are no decisions rendered by a court or the Board in any proceeding identified about in Section II pursuant to 37 C.F.R. § 41.37(c)(1)(ii).

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SUBMISSION OF APPEAL BRIEF

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Sir:

Submitted herewith please find an Appeal Brief. The required fee is being separately authorized via the Electronic Filing System (EFS).

Respectfully submitted,

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